# INSTITUTIONAL PROCESS FOR STORMWATER MANAGEMENT IN SHARED WATERSHEDS

## THE PAGAN RIVER WATERSHED

## A PILOT STUDY


**Prepared by the Staff of the**
**Hampton Roads Planning District Commission**

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## BACKGROUND

Through its Regional Coastal Resources Management Program, the Hampton Roads Planning District Commission assists its fourteen member local governments in addressing stormwater management issues. This program is known as the Regional Stormwater Management Program. It includes conducting technical studies, facilitating monthly meetings of the HRPDC Regional Stormwater Management Committee to exchange information and developing, in cooperation with that Committee, regional consensus positions on stormwater management issues.

The Regional Stormwater Management Program began in 1973 with a regional stormwater facilities study and analysis. That effort included delineation of drainage basins throughout the Southeastern Virginia portion of the region. From 1974 through 1986, the regional stormwater management program was conducted under the auspices of the Hampton Roads Water Quality Agency.

A renewed effort for Southeastern Virginia was begun in 1988 through financial assistance from the Virginia Coastal Resources Management Program (VCRMP). That effort resulted in the 1989 release of two studies:

1. Elizabeth River Basin Environmental Management Program.

2. Regional Stormwater Management Strategy for Southeastern Virginia.

These two studies recommended that a number of activities be undertaken on a cooperative regional basis to assist the region's local governments in meeting the requirements of the U.S. Environmental Protection Agency's National Pollutant Discharge Elimination System (NPDES) Stormwater Permit Program, the Virginia Stormwater Management Program and the Virginia Chesapeake Bay Preservation Act. Recommended activities included development of common design standards for stormwater facilities, a cooperative program for water quality sampling and analysis, an information exchange program, a cooperative public education program and mechanisms for financing needed facilities and programs. It should be noted that the program was expanded to include not only Southeastern Virginia, but also the Virginia Peninsula, beginning with the 1990 establishment of the Hampton Roads Planning District Commission.

Through financial assistance from the Virginia Council on the Environment, the Chesapeake Bay Local Assistance Department and the State Water Control Board, the HRPDC has completed several studies to achieve these recommendations. They include:

- Stormwater Management Financing Strategy for Hampton Roads Virginia, 1991.

- o Best Management Practices Design Guidance Manual for Hampton Roads Virginia, 1992.
- o Model Environmental Assessment Procedure, 1992.
- o Vegetative Practices for Nonpoint Source Pollution Management, 1992.
- o A Citizen's Guide to Nonpoint Source Pollution, in progress, 1993.
- o Best Management Practices (BMP) Tracking System, including computer software, 1992.

In addition, the localities have developed a cooperative stormwater sampling program with the Hampton Roads Sanitation District (HRSD) and a number of educational materials through the Hampton Roads Municipal Communicators, the regional organization of local public information officers.

In October 1991, the HRPDC obtained financial assistance from the Virginia Council on the Environment through the Virginia Coastal Resources Management Program to develop a BMP Tracking System and a Shared Watershed Institutional Process. The Scope for this project was modified in September 1992 to include support for the Commission's Regional Stormwater Management Program.

## SHARED WATERSHED STORMWATER MANAGEMENT ISSUE

Local governments in the Hampton Roads region frequently share the watersheds of small streams and tributaries to the Chesapeake Bay and its major tributaries. Development and stormwater management in such watersheds is complicated by multiple review processes and stormwater management requirements. Without coordinated management, this situation may result in individual developments being affected by two sets of differing requirements and in facilities that are inadequate to handle stormwater from future development in adjacent jurisdictions. Recognizing that this situation presents long-term management difficulties to local governments and to the development community, local government staff, through the Hampton Roads Chesapeake Bay Committee, requested the HRPDC staff to develop an institutional approach for managing stormwater and nonpoint source pollution in these watersheds in a cooperative fashion. On an ad hoc basis, an attempt was made to do this some years ago through the Hampton Roads Water Quality Agency. A textbook approach to small watershed management was outlined in the 1989 Regional Stormwater Management Strategy for Southeastern Virginia and in the Elizabeth River Basin Environmental Management Program. The latter study also outlined an approach to analysis of locality goals, objectives and development policies to determine their consistency with water quality goals and objectives.

Through financial assistance from the Virginia Council on the Environment, the HRPDC, in cooperation with local government staff, has undertaken a pilot study to develop an institutional process for cooperative management of stormwater and nonpoint sources of pollution in small shared watersheds. A number of watersheds were evaluated for possible consideration in this study. They included urban, rural and developing watersheds and involved various combinations of local governments. Based on the HRPDC staff evaluation and discussions with potentially involved localities, the Pagan River was selected for consideration as the pilot watershed. This report documents the results of that pilot study.

Selection of Pilot Watershed

The Pagan River Watershed in Isle of Wight County and the Town of Smithfield was selected for analysis as a pilot area for the Shared Watershed Institutional Process. The Pagan River was selected for a variety of reasons:

1. The size of the watershed and the number of involved jurisdictions was manageable.

2. The watershed will be served by municipal wastewater treatment facilities in the immediate future, which will enhance its development potential. Thus, there is likely to be significant need for stormwater management and related facility development in the near future.

3. Both jurisdictions indicated an interest in participating in the project.

It should be noted that due to population size neither Isle of Wight County nor the Town of Smithfield is presently subject to the requirements for municipal Stormwater NPDES Permits. Both could become subject to the municipal permit requirements in the future. Certain industrial activities, including construction, within both jurisdictions are subject to the Stormwater NPDES Permit requirements for industrial activities. Both jurisdictions are participating in the Regional Stormwater Management Strategy for Small Communities, which is being undertaken by the HRPDC.

## THE PAGAN RIVER WATERSHED

The Pagan River Watershed encompasses the northeastern corner of Isle of Wight County. The Town of Smithfield lies wholly within the Watershed. The Pagan River is a tributary to the James River, entering the James River approximately fifteen (15) miles upstream from its mouth. Figure 1 depicts the Watershed.

The Pagan River Watershed encompasses approximately seventy-one (71) square miles. The watershed is predominantly rural with more than 80% of the land area presently in agricultural or silvicultural use. Less than 10% of the land area,

including the Town of Smithfield, which is approximately six square miles in size, is urban or urbanizing. The watershed contains extensive areas of tidal and nontidal wetlands. Intensive industrial activities are located at Smithfield.

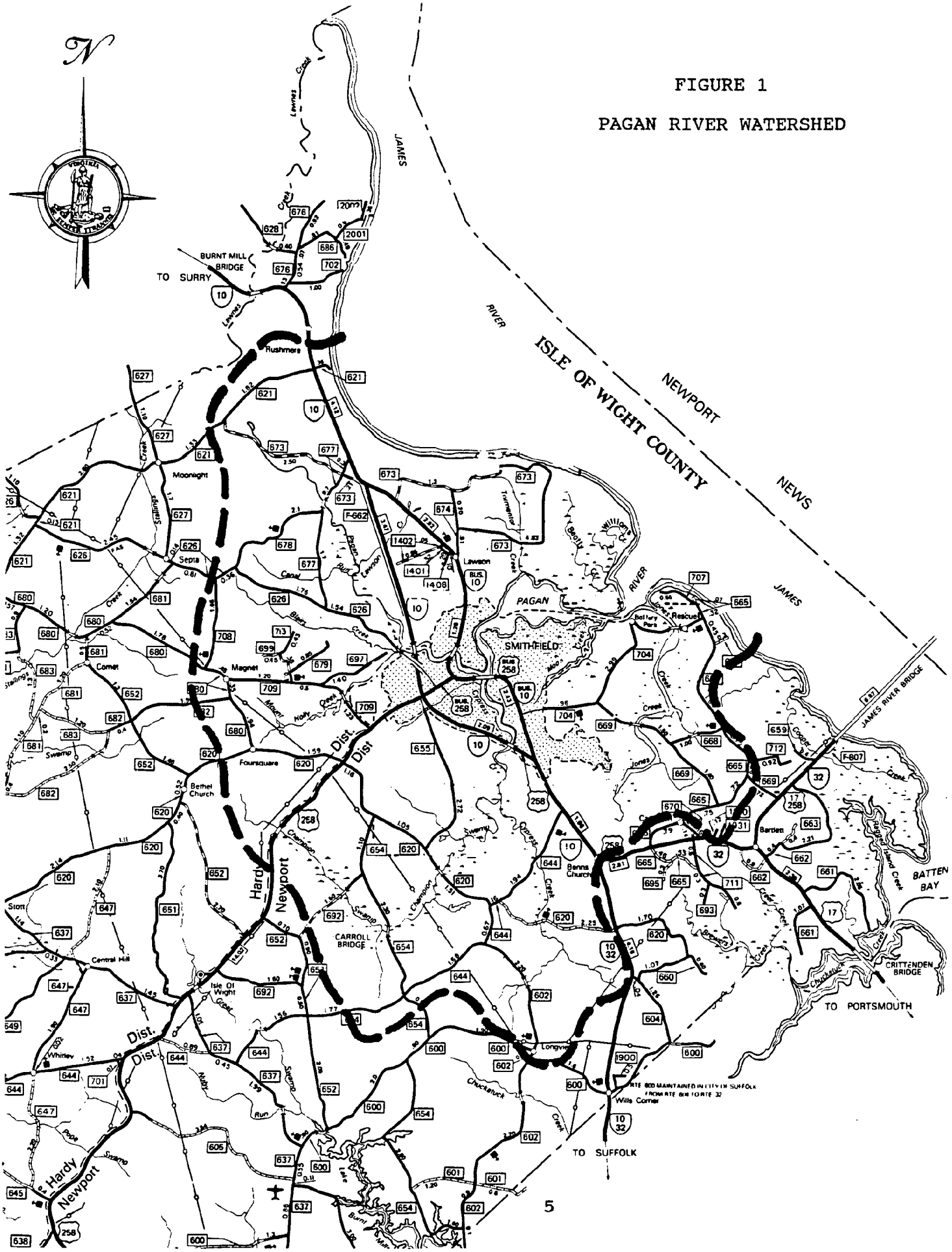
Historically, the Pagan River has exhibited poor water quality. This is due largely to the natural characteristics of the River, which receives relatively little freshwater input. Point source discharges from existing wastewater treatment facilities, coupled with nonpoint source pollution from the watershed's agricultural lands, have contributed to low dissolved oxygen levels, high nutrient levels and high fecal coliform levels. Nutrients and oxygen-demanding substances in the sediment also contribute to water quality degradation.

As indicated previously, central wastewater facilities will be provided to most of the watershed by 1995. Facilities will be provided by the Hampton Roads Sanitation District and will convey all wastewater out of the watershed for subsequent treatment and discharge. At that time, the three existing wastewater treatment plants will cease their discharge to the Pagan River. Following the removal of point source discharges to the River, water quality conditions will be dominated by nonpoint source pollution, stormwater runoff and pollutants in the River's sediments. Observation of historic conditions in the Lynnhaven River in Virginia Beach following the removal of point source discharges indicates that water quality conditions are likely to improve. However, those anticipated water quality improvements can be negated by future nonpoint source pollution and stormwater runoff unless that runoff is carefully managed.

Recent transportation improvements and the growth of the Hampton Roads metropolitan area have increased the desirability of the watershed for exurban and suburban development. Historically, poor soil conditions for septic tanks have reduced the development potential of the watershed. Provision of municipal wastewater treatment facilities for the entire watershed is expected to further enhance the development potential of the watershed.

FIGURE 1

PAGAN RIVER WATERSHED



## WATERSHED DEVELOPMENT GOALS

The Town of Smithfield and Isle of Wight County both adopted new Comprehensive Plans in 1991. Both Plans elevate the consideration given to environmental issues in local planning and development management. They both contain extensive goals and objectives for development and environmental protection in the watershed. The environmental goals, adopted in the two communities' Comprehensive Plans are further detailed in their adopted Chesapeake Bay Preservation Act Programs and Ordinances.

The Isle of Wight County Comprehensive Plan uses a comprehensive growth management strategy to enhance development management and environmental protection efforts. Central to this strategy is the establishment of Development Service Districts, where facilities that support development will be provided. Management efforts attempt to guide growth to occur in the Development Service Districts. The eastern portion of the Pagan River Watershed is contained within the County's Northeast Development Service District. The southern and western portions of the Watershed are contained in the County's Rural/Agricultural/Conservation and Resource Conservation Districts.

County Goals, adopted in the Isle of Wight County Comprehensive Plan, include:

- To guide future development into an efficient and serviceable form which is protective of the County's predominantly rural character; and,

- To preserve and improve the environmental quality of the County through measures which protect Isle of Wight's natural resources and environmentally sensitive lands and waters.

Objectives to provide public facilities and services within the Development Service District, to protect environmental resources and to manage development in an environmentally sensitive manner are established to ensure that these goals are achieved.

Similarly, the Town of Smithfield's Comprehensive Plan establishes goals and objectives to support development in a manner which is protective of the Town's natural environment. Specific goals, contained in the Town of Smithfield Comprehensive Plan, which address these issues include:

- Enhance and protect the natural setting of Smithfield; promote a greater awareness of the natural beauty and positive attributes of the Town site; and preserve environmentally sensitive areas; and,

- o Encourage and provide for harmonious and wise use of the land in a manner that meets the needs of the population, stimulates physical, social and economic development, and protects the ecological balance in the Town and surrounding area.

Objectives and strategies to achieve these and other adopted goals are outlined in the Comprehensive Plan and serve as the basis for regulatory and other initiatives.

## DEVELOPMENT REGULATIONS

Isle of Wight County and the Town of Smithfield have both adopted comprehensive packages of development management regulations. Both communities have adopted Zoning, Subdivision, Erosion and Sediment Control and Chesapeake Bay Preservation Act (CBPA) Ordinances. Neither community has adopted a stormwater management ordinance or program per se. As noted earlier in this report, neither community is presently required by state or federal stormwater regulations to adopt a discrete stormwater management program. However, the Chesapeake Bay Preservation Act Ordinances adopted by the County and the Town contain the stormwater performance criteria required by the Act. Thus, through their CBPA and Erosion and Sediment Control Ordinances, both have adopted the basic elements of a stormwater management program.

Isle of Wight County and the Towns of Smithfield and Windsor agreed, in the mid-1970s, that the Erosion and Sediment Control Programs of the three localities would operated jointly with the County responsible for routine implementation activities, such as plan review, inspections and enforcement. Administrative and technical provisions in the Ordinances of the two communities are identical. Also, the technical provisions of the CBPA Ordinances adopted by the two communities are identical.

## CONSISTENCY ANALYSIS

This study has analyzed the goals and objectives, adopted by Isle of Wight County and the Town of Smithfield in their Comprehensive Plans to determine areas of conflict or consistency between the two. Additionally, local goals and objectives were analyzed to determine areas of consistency or conflict with other adopted state, federal and local environmental and water quality goals. Goals and objectives, adopted by Isle of Wight County and the Town of Smithfield, are generally consistent with each other. Environmental goals, adopted by the two communities, are consistent with state and federal water quality goals, as embodied in the Clean Water Act, the State Water Control Law and the Chesapeake Bay Preservation Act. Development goals, adopted by the two communities, exhibit some areas of potential conflict with those state and federal goals. However, both Comprehensive Plans and

related development ordinances contain strategies designed to ameliorate the adverse impacts of those potential conflicts.

The development ordinances, adopted by Isle of Wight County and the Town of Smithfield, are designed to address areas of potential conflict between development and environmental protection. As indicated previously, the Erosion and Sediment Control Ordinances and CBPA Ordinances, adopted by the County and the Town are identical. The County administers the Town's Erosion and Sediment Control Ordinance. In implementing their CBPA Ordinances, both jurisdictions rely on the same technical guidance and standards. Both use the Nonpoint Source Calculation Procedure, developed by the Chesapeake Bay Local Assistance Department, as the basis for reviewing development compliance with the CBPA Stormwater Performance Criteria. The Erosion and Sediment Control Handbook, developed by the Virginia Department of Conservation and Recreation Division of Soil and Water Conservation, serves as the basis for Erosion and Sediment Control Plans and the evaluation thereof in both localities. Both localities also use two technical documents, developed by the Hampton Roads Planning District Commission, in stormwater management evaluation and planning. They are:

- Best Management Practices Design Guidance Manual for Hampton Roads Virginia, 1991.

- Vegetative Practices Guide for Nonpoint Source Pollution Management, 1992.

Thus, technical requirements for stormwater management governing development in the two communities are identical.

An institutional process for development review that facilitates the application of these technical requirements in a manner which ensures that upstream and downstream conditions and needs are considered is the next step in coordinated development management in the watershed. The foundation for this coordination has been established in several ways:

- A memorandum of agreement has been developed between the County and Town, providing for County administration and enforcement of the Town's Erosion and Sediment Control Ordinance.

- Both communities are participating in the Regional Stormwater Management Program. Specifically, both communities are participating in the regional study of the stormwater management needs of small communities.

- o Both communities have participated actively in the conduct of this pilot study.

## STUDY PROCESS

Conduct of this pilot study has involved a cooperative effort by staff from Isle of Wight County, the Town of Smithfield and the Hampton Roads Planning District Commission. Each had specific responsibilities. The HRPDC staff was responsible for the following:

1. To review and analyze the Comprehensive Plans and Development Regulations of the two communities.

2. To document the results of that review and development recommendations for consideration by the two communities.

3. To facilitate discussions between County and Town staff in order to reach a consensus on issues needing consideration and on the design of the coordinated process.

County and Town staff were responsible for documenting local goals, objectives and plans for the watershed. They were requested to identify technical issues that needed to be considered and institutional considerations that needed to be accommodated in the design of the coordinated process.

The study effort involved two meetings of study participants and a series of telephone conversations between them. The purpose of these meetings and telephone conversations was to identify issues, to reach consensus on methods of addressing those issues and to concur with the final report produced by the HRPDC staff. Through this process, consensus was reached on the following points:

- o An institutional mechanism for coordinated development review to ensure consistent management of stormwater in the Pagan River Watershed is desirable.

- o The institutional mechanism needs to be informal, at this time. It should incorporate a staff level review process.

- o Common design standards for stormwater management are appropriate. As noted previously in this report, they are already in place insofar as Erosion and Sediment Control and CBPA Stormwater Performance Criteria are concerned. As specific stormwater management programs are developed, common design standards should be included.

- o Requirements for operation and maintenance of non-local government stormwater management facilities should be developed to ensure the long-term effectiveness of the facilities and to ensure that doe not become an administrative or financial burden to the locality. This issue will be addressed in detail in the Regional Stormwater Management Strategy for Small Communities, being developed by the HRPDC.

- o A formal institutional structure for cooperative stormwater management should be evaluated and developed if appropriate and necessary as one element of the proposed Regional Stormwater Strategy for Small Communities. (That study, to be conducted by the HRPDC, will be undertaken during 1993.)

- o The two communities should continue informal discussions concerning broader coordination of development review.

- o The HRPDC staff should be available to facilitate joint meetings between staff from the two jurisdictions if desired and requested.

- o An informal staff-level process should be established to permit review of stormwater management plans for development within the watershed. Initially, this review should focus on developments on lands adjacent to the jurisdictional boundary.

## STORMWATER MANAGEMENT REVIEW PROCESS

To begin the process of cooperative stormwater management by Isle of Wight County and the Town of Smithfield, a coordinated review process addressing stormwater management issues, associated with specific development proposals should be instituted. The following process provides for a staff level review and coordination effort. It is structured, at present, as an informal process that can be modified and formalized as experience and future program needs dictate.

1. Developer submits development plan, including stormwater management plan, to locality where project is located.

2. Local staff reviews development plan in accordance with normal County and/or Town administrative procedures.

3. If property drains to a tributary stream flowing through the other locality, the staff from the reviewing locality will advise staff from the other locality and request comments.

4. If property abuts the adjacent locality, the staff from the reviewing locality will advise staff from the other locality and request comments.

5. If stormwater facilities in the development could serve upstream development in the adjacent locality, staff from the reviewing locality will contact the other locality to determine development plans and scheduling on upstream lands. The reviewing locality will attempt to ensure that facilities will be designed to serve any expected future development.

6. Both localities will attempt to use the proffer system to ensure that stormwater management facilities are designed to accommodate potential future development throughout the area that is tributary to those facilities without regard to jurisdictional boundaries.

## CONCLUSIONS AND RECOMMENDATIONS

Based on this pilot study of the Pagan River Watershed, involving Isle of Wight County and the Town of Smithfield, a number of observations about the utility of the "Shared Watersheds Process" can be made.

1. The "Shared Watersheds Process" is a useful exercise for encouraging discussions between two or more communities. It can lead to increased cooperation in stormwater management.

2. The "Process" would appear to be more necessary in coordinating development review and stormwater management in watersheds where considerable development is already occurring and where the involved localities have already established stormwater management programs and design standards. However, in such cases, it can be expected that this process will require more protracted negotiations. Where specific development proposals are under review, the developer(s) or their representatives will need to be brought into the process prior to finalizing recommendations.

3. Certain tasks, outlined in the original scope of work for this project, are not specifically necessary, at least in the Hampton Roads region, to development of a consensus on stormwater management issues. These are the tasks involving analysis of local comprehensive plan goals and objectives and determination of consistency/inconsistency between the goals and state and federal environmental goals.

4. Review of stormwater management requirements and facility design standards and identification of consistency and inconsistency among

them is the critical technical task in a "Shared Watershed Process" project.

5. The most critical element in the success of the "Process" is the facilitated negotiation process.

6. Assuming interest and desire from other communities in Hampton Roads, a "Shared Watershed Process" project should be undertaken in the future for a watershed which is subject to current development pressures and which has active development projects, located in one or more communities in the watershed.

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